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1. Your reference

101510/JPR/sjr

2. Patent application number

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**0005018.7**

01 MAR 2000

3. Full name, address and postcode of the or of  
each applicant (*underline all surnames*)

Peter Ernest Hookham-Miller

No. 9 Monk Well Square  
London EC2Y 5BNPatents ADP number (*if you know it*)7845761001  
DfIf the applicant is a corporate body, give the  
country/state of its incorporation

4. Title of the invention

INTERACTION WITH A TELEVISION SYSTEM

5. Name of your agent (*if you have one*)PAGE WHITE & FARRER  
54 Doughty Street  
London WC1N 2LS"Address for service" in the United Kingdom  
to which all correspondence should be sent  
(*including the postcode*).Patents ADP number (*if you know it*)

1255003

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Country

Priority application number  
(*if you know it*)Date of filing  
(*day / month / year*)7. If this application is divided or otherwise  
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Number of earlier application

Date of filing  
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to grant of a patent required in support of  
this request? (*Answer 'Yes' if:*

Yes

- a) *any applicant named in part 3 is not an inventor, or*
- b) *there is an inventor who is not named as an  
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Description 13

Claim(s) 5

Abstract

Drawing(s) 2 + 1 / 1

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Translations of priority documents

Statement of inventorship and right to grant of a patent (Patents Form 7/77)

Request for preliminary examination and search (Patents Form 9/77)

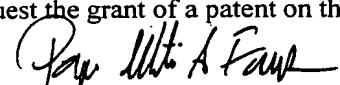
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11.

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12. Name and daytime telephone number of person to contact in the United Kingdom

Juna-Pekka Ruuskanen  
0171 831 7929

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**INTERACTION WITH A TELEVISION SYSTEM**

The present invention relates to provision of interactive services for viewers of TV programmes, and in particular, but 5 not exclusively, to interactivity that is provided by means of a telecommunication system.

A television system and the concept of displaying television programmes to viewers of television sets is known in the art.

10 The television programmes are typically shown either in live transmissions or as recorded programmes. The live transmissions shows an event, such as a football game, substantially in real-time for the viewers. The recorded programmes have been prepared beforehand and will be shown 15 later on to the viewers at an appropriate time. The operation of a conventional television system and the basic elements thereof are well known to a skilled person, and will thus not be explained herein in more detail.

20 Television programmes can be divided in several categories, such as news, sport, game shows, drama series, movies, children programmes, educational programmes and so on. For example, the purpose of the educational programmes is to help the viewers thereof to learn new things and to develop their 25 knowledge and/or skills. The educational programmes may be viewed by various groups of people, such as small children or schoolchildren or anybody else wishing to learn new things.

Programmes, such as the educational programmes and/or game 30 shows, often include various stimulating features or events, such as questions to be answered or special tasks to be performed by the viewers or other events to which the viewers

may wish to give feedback or from which the viewers may wish to receive more information.

It is believed that interactivity may make the programmes more interesting and/or increase the efficiency of the educational programmes. For example, the viewer may wish to have with possibility to respond to questions, events or other stimulating features of the programmes they are currently viewing. The conventional TV systems, however, may not be able to provide as feasible, easy-to-use and affordable interactivity to the viewers as they might wish to have.

The previous proposals have suggested use of public switched telecommunication networks (PSTN) for the this purpose. In accordance with the earlier proposals the viewer needs to have a telephone in order to make a telephone call to the television studio. The viewer may also contact the studio through a personal computer PC connected to a data network (such as the Internet) to give his answer or give some other feedback. The television systems in general may not have been enabled to provide tailored communication towards selected viewers other than the communication via the television signal that is displayed by the TV apparatus and communication by calling to the viewer through the public telephone network.

A problem with the prior art interactivity is that the viewer needs to have a telephone subscription and telephone terminal apparatus. The viewer needs also to make a call to a particular number provided by the program. The viewer needs also often to pay for the connection. Although the Internet may be used for the communication, not everyone has a home PC that is connected to the Internet. The viewer is also typically charged for the connection time, although freephone

arrangements are known. A percentage of people may also find the PCs and Internet subscriptions too expensive and/or difficult to install and use and/or operate. The previous proposals may thus not have been able to deliver a cost-  
5 workable solution for interaction with the TV system, such as for the interactive learning. This has been held back by lack of solutions offering an affordable and workable solution for providing communication channel towards the TV system. In addition, the viewers may wish to have mobility while viewing  
10 the program. The mobility may be restricted by a wired connection between a controller and the telecommunication system.

It is an aim of the embodiments of the present invention to  
15 address one or several of the above problems.

According to one aspect of the present invention there is provided a method for providing interaction between a viewer of a television program provided by a television system and  
20 the television system, comprising:  
displaying the television program to the viewer; generating a packet data message that is to be transmitted between a management unit that is associated with the television system and connected to a packet switched telecommunication system  
25 and a controller which the viewer may operate while viewing the program, the controller being associated with a wireless module enabling wireless communication link between the controller and the packet switched telecommunication system;  
and transmitting the packet data message between the wireless  
30 module and the packet switched telecommunication system via the wireless link.

In the further embodiments, the packet data message may be generated by the management unit. The packet data message may contain control instructions for the controller. The controller may also generate a packet data message and

5 initiates the transmission of the packet data message to the management unit. The management unit may generate a further packet data message in response to receiving the packet data message from the controller.

10 The television program may include at least one event to which the viewer may react by inputting a response into the controller.

15 The controller may present to the viewer of the program an audio message and/or a visual message based on the packet data message generated by the management unit. The message may comprise one or more questions. The message may also comprise feedback to the viewer regarding answers the viewer has input into the controller. Wireless transmission of voice messages 20 may be based on the voice over internet protocol.

The generation of a packet switched message may be triggered based on a time-code in the film that is used when presenting the program.

25 The viewer may input a speech message into the controller, whereafter the speech message may be modified for the transmission over the wireless link and the packet switched telecommunication system and the speech message is received 30 and recognised in the management unit.

At least one element of the controller may be operated based on the packet switched message generated by the management unit.

5 Information regarding the viewer may be stored in a database. The viewer may modify the information stored in the database. The packet data message may be routed to the controlled based on information in the database. The packed data message may also be tailored based on information in the database.

10

According to another aspect of the present invention there is provided a system for providing communication between a viewer of a television program and a television system providing the program, comprising:

15 a television network for distributing the program to the viewer; television terminal for displaying the television program to the viewer; a packet switched telecommunication system; a management unit that is associated with the television system and connected to the packet switched telecommunication system; a controller which the viewer may operate while viewing the program, the controller being associated with a wireless module enabling wireless communication link between the controller and the packet switched telecommunication system; and control means for 25 generating a packet data message that may be transmitted between the management unit and the controller via the wireless communication link.

The embodiments of the invention may provide a cost effective way for enabling the viewer of a TV programme to interact with it. The embodiments may enable an easy and/or affordable interaction with the TV program that may be used in any home today with the existing television set. Advantages may be

especially obtained in the field of interactive learning and/or children programs that may become more interesting for the viewers, feasible and affordable than in the conventional solutions. Some embodiments may enable selective messaging 5 from the television system to selected viewers.

For better understanding of the present invention, reference will now be made by way of example to the accompanying drawings in which:

10 Figure 1 shows one embodiment of the present invention; and

Figure 2 is a flowchart illustrating the operation of one embodiment of the present invention.

15 Reference is made to Figure 1 which shows an embodiment of the present invention. Figure 1 shows in the left-hand side thereof a public television broadcast network 5. The television network 5 can be of any type, such as a conventional analogue network or a digital television network.  
20 The network 5 includes a wireless transmitter or antenna 2 for transmitting the television signal towards television apparatus 1. It should be appreciated that instead of distributing the television signal through antennae, the signal may be distributed through cable or satellite  
25 subscriptions (not shown). It should also be appreciated that although only one antenna and TV set is shown for clarity reasons, the number of the antennae and TV sets connected to the TV network is typically much higher.

30 The television network is also provided with a broadcasting apparatus 3 for the provision of the TV programmes to the antennae. It should be understood that the broadcasting apparatus typically includes various different elements in the

TV studio and elsewhere in the television system. The apparatus that is required for the provision of the television program signal from the TV studio to the antenna 2 and the operation thereof is well known, and will thus not be  
5 described in more detail.

A telecommunications network 6 is shown in the right-hand side of Figure 1. The telecommunications system includes various elements, such as one or more base stations 9 and appropriate  
10 network controllers (not shown for clarity reasons) and one or more gateways 8. It should be appreciated that base stations can sometimes be referred to as node B.

The telecommunications network 6 may comprise any network that  
15 is capable of providing wireless packet switched services, such as a General Packet Radio Service GPRS network, EDGE (enhanced data rate for GSM evolution) Mobile Data Network or an appropriate third generation telecommunication system such as a CDMA (code division multiple access) or TDMA (time  
20 division multiple access) based 3<sup>rd</sup> generation telecommunication systems referred to as Universal Mobile Telecommunication System UMTS. The GPRS network is described in more detail for example in 3GPP technical specification 3G TS 23.060 "General Packet Radio Service (GPRS); Service  
25 Description; Stage 2", January 2000. This document is incorporated herein by reference. A UMTS system that is based on a WCDMA (wideband code division multiple access) is described in more detail e.g. in UMTS related 3GPP technical specifications.

30 Data rates up to 115kbit/s may be transmitted via the wireless interface in accordance with the present GPRS specifications, although the rate may be even more in the future applications.

This enables wireless transmission of information at a speed that may be used in the embodiments. The introduction of GRPS (General Packet Radio Service) is one of the key steps in the evolution of today's GSM (Global System for Mobile) networks 5 to third generation systems, and the first commercial GPSR services are believed to be launched in near future. Following the arrival of GPRS, a further step in the bandwidth model is believed to occur with EDGE, with speeds of up to 384kbit/s being possible. The bandwidth potential of the UMTS is in the 10 first phase believed to be up to 2Mbit/s, and even more in the future. The wireless packet switched services will enable the embodiments of the invention due to their capability of providing wireless high speed data connection that was not facilitated by the conventional circuit switched wireless 15 connections.

A further advantage the packet switched wireless services when compared to the conventional wireless services is that the packet switched service will always be available. The user 20 thereof may pay only for the content used and not the length of time connected. This enables a seamless mobile access to a whole range of new and existing Internet Protocol (IP) based services. The viewers will be able to stay permanently logged-on to the interactive services and to send data to and to 25 receive data from the management unit of the television system 5 with large file attachments in an instant. Since the viewers may be always connected and always on-line, the interactive services will be easy and quick to access and, with the capability to charge per data bit sent and received, customers 30 will be able to pay only for the usage of the data transmission resources, e.g. per a data packet transmitted.

The Figure 1 system includes further a data processing apparatus or management unit 4 that is associated with the television system 5. The management unit 4 may be controlled by the TV company and/or TV studio. The management unit 4 may 5 also be operated and run by an independent service provider providing interactivity services for TV companies. The presenter of a program and/or the production team of a TV program may also have a connection to the management unit 4 so that they may communicate with the viewers through the 10 interaction system and/or control the communication between the viewer and the management unit 4.

A database 7 is provided for storing information of the users of the interactive system, as will be explained later. Voice over IP (Internet Protocol) and other possible gateway apparatus 8 of the system is also shown. The possible operation thereof also be explained later in more detail 15 later. It is sufficient to note that the TV systems include system such as wireless broadcasting systems, satellite 20 transmission systems and cable TV systems and so and that the TV transmissions may comprise analogue or digital TV signal.

The embodiments of the invention are based on use of a on-site controller that the viewer may see and operate while watching 25 the TV 1. The controller provides a mobile interactive remote station that may communicate with the packet switched telecommunication system 6. More particularly, the controller 10 is provided with a radio module 12 that is enabled to have 30 a wireless high speed data connection with the base station 9.

According to the embodiment of Figure 1 the controller 10 is associated with a teddy bear. It should be appreciated that in the following description any reference to Teddy 10 is also a

reference to a mobile on-site controller in accordance with the present invention.

The Teddy 10 may be provided with voice output and/or various  
5 trigger sensors in the body thereof. A graphics display 11 and selection buttons 15 may also be provided in the Teddy. The display may be adapted to show still images or video images that are based on signal received via the wireless transmission from the base station 9. The display 11 may also  
10 comprise so called touch screen function. A more detailed description of the functions of the Teddy 10 and various components thereof will be given in the following.

When one of the Teddies or other appropriate controllers is  
15 purchased, the buyer may complete a registration form identifying the owner of the controller or the users of the controller (e.g. all members of a family). In this way, the interaction can be personalised to each individual. One or more of the following criteria may be used as part of the  
20 personalisation process: first name; last name; date of birth; sex; colour of eyes; colour of hair and so on.

The above information which can be submitted e.g. by postcard, Internet, (e.g. through Hyper Text Mark-up Language HTML  
25 pages), telephone or personal visit to the provider of the interactive services. This information will be stored in the database 7 and the Teddy is personalised to each viewer based on the stored information. The database 7 may feed this information towards the gateway 8 and/or towards the data  
30 processing apparatus or management unit 4 that is associated with the television system 5. The data may be used when predefined events are triggered by the programme.

The TV programme production company may create a program which make use of the interactive Teddy 10. The programme may be recorded in the normal fashion. A time-code of the film may be used to trigger signalling that is to be sent towards the

5 teddy 10. The generation of the messages may be triggered by predetermined event in the production. The messages which will be sent to each Teddy may take, for example, the form of voice data, video data and control instruction data.

10 The triggered message and personalisation data may be combined to form a "Sound Event". This is sent to a Gateway where the sound file is converted using e.g. Voice Over IP protocol and transmitted over a GPRS, EDGE or UMTS Mobile Data Network to the Teddy 10.

15

The Teddy 10 may contain a GPRS transceiver module 12 and an appropriate data processing unit 13, such as a Symbian EPOC micro-processor. The EPOC platform may be used because it supports Wireless Application Technology (WAP) and may be used 20 with a Voice Over IP (VoIP) client.

Sound message may be output by one or more speakers built into the Teddy (not shown, but may be built in, for example, in the mouth of the teddy bear). The sound message may be based on 25 the signal fed by the VoIP conversion. A microphone could also be built into the Teddy 10 (e.g. in one or both ears) allowing the child to talk back. The input may again be encoded using VoIP and transmitted back to the control system 4, where a speech recognition software could interpret what has been 30 said. The control system 4 may then generate an appropriate response.

With reference to Figure 2, the following is an example of the operation of an embodiment of the present invention. When the cuddly toy, such as the teddy bear 10, is not used as an interface towards the TV system, it can be played with in a normal manner. When a particular broadcast starts, the child may activate the toy e.g. by squeezing the toy's nose or by touching or pressing other predefined part or activation means of the toy. The toy is activated, i.e. 'comes into life', and as the broadcast continues, the toy may ask questions in relation to the broadcast. The child may interact with the program by sending responses through the Teddy 10 (e.g. by pressing one or several of the buttons thereof or by touching an element of the toy given to him/her by the program). The answers may be verified by the management unit 4, and feedback may be given to the child regarding the correctness of the answers.

In accordance with a further embodiment the design of the Teddy 10 is such that mechanical movement of at least some body parts 14 thereof are enabled. This may affect the amount of battery power required, but would also add to the over-all design. Movement of the mouth, eyes, head, limbs and ears are all possible. The movement may be controlled by the management unit 4 via the packet switched wireless network. For example, the movements of the various elements of the teddy bear 10 may follow the story of the program, or give feedback to the child based on the responses he/she has given to the questions. It should be appreciated that similar control instruction mechanism may be employed to control the operation of any controller and/or the various components thereof that may be employed when implementing the embodiments of the present invention.

According to an embodiment, WAP technology may be employed. For example, the display and selection buttons built into the Teddy 10 may also be based on use of a wireless application protocol (WAP).

5

The user may also be able to customise the interactive service based e.g. on an HTML interface and a PC.

When the toy, such as the teddy bear 10 or any other cuddly 10 toy, is not used as an interface towards the TV system, it can be played with in a normal manner.

It should be appreciated that whilst embodiments of the present invention have been described in relation to a teddy 15 bear and child programs, embodiments of the present invention are applicable to any other suitable type of control equipment and programmes. For example, the programmes may include games which the viewer may take part and/or send answers, or the programs may ask the viewers to express their opinion or give 20 their vote in issues raised by the program.

It is also noted herein that while the above describes one exemplifying embodiment of the invention, there are several variations and modifications which may be made to the 25 disclosed solution without departing from the scope of the present invention as defined in the appended claims.

**Claims**

1. A method for providing interaction between a viewer of a television program provided by a television system and the television system, comprising:
  - 5 displaying the television program to the viewer;
  - generating a packet data message that is to be transmitted between a management unit that is associated with the television system and connected to a packet switched telecommunication system and a controller which the viewer may operate while viewing the program, the controller being associated with a wireless module enabling wireless communication link between the controller and the packet switched telecommunication system; and
  - 10 transmitting the packet data message between the wireless module and the packet switched telecommunication system via the wireless link.
- 15 2. A method as claimed in claim 1, wherein the packet data message is generated by the management unit.
- 20 3. A method as claimed in claim 2, wherein the packet data message contains control instructions for the controller.
- 25 4. A method as claimed in any preceding claim, wherein the controller generates a packet data message and initiates the transmission of the packet data message to the management unit.
- 30 5. A method as claimed in claim 4, wherein the management unit generates a further packet data message in response to receiving the packet data message from the controller.

6. A method as claimed in any preceding claim, wherein the television program includes at least one event to which the viewer may react by inputting a response into the controller.

5 7. A method as claimed in any preceding claim, wherein the controller presents to the viewer of the program an audio message and/or a visual message based on the packet data message generated by the management unit.

10 8. A method as claimed in claim 7, wherein the message comprises one or more questions.

9. A method as claimed in claim 7, wherein the message comprises feedback to the viewer regarding answers the viewer  
15 has input into the controller.

10. A method as claimed in any of claims 7 to 9, wherein the wireless transmission of voice messages is based on the voice over internet protocol.

20 11. A method as claimed in any preceding claim, wherein the generation of a packet switched message is triggered based on a time-code in the film that is used when presenting the program.

25 12. A method as claimed in any preceding claim, wherein the viewer inputs a speech message into the controller, the speech message is modified for the transmission over the wireless link and the packet switched telecommunication system and the  
30 speech message is recognised in the management unit.

13. A method as claimed in any preceding claim, wherein the television program is an educational program.

14. A method as claimed in claim 2 or any claim that is appended thereto, wherein at least one element of the controller is operated based on the packet switched message  
5 generated by the management unit.

15. A method as claimed in claim 14, wherein the at least element is moved based on a control instruction in the packet switched message.

10

16. A method as claimed in any preceding claim, wherein the packet data messages are transmitted through at least one of the following networks: a General Packet Radio Service network; Enhanced Data Rate for GSM Evolution Network; a  
15 Universal Mobile Telecommunication System network.

17. A method as claimed in any of the preceding claims, wherein information regarding the viewer is stored in a database.

20

18. A method as claimed in claim 17, wherein the viewer may modify the information stored in the database.

25

19. A method as claimed in claim 17 or 18, wherein the packet data message is routed to the controlled based on information in the database.

20. A method as claimed in claim 17 to 19, wherein the packed data message is tailored based on information in the database.

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21. A method as claimed in any preceding claim, wherein the controller associates with a toy.

22. A method as claimed in claim 21, wherein the toy is a cuddly toy, a dolly or the like.

23. A system for providing communication between a viewer of 5 a television program and a television system providing the program, comprising:

a television network for distributing the program to the viewer;

10 television terminal for displaying the television program to the viewer;

a packet switched telecommunication system;

a management unit that is associated with the television system and connected to the packet switched telecommunication system;

15 a controller which the viewer may operate while viewing the program, the controller being associated with a wireless module enabling wireless communication link between the controller and the packet switched telecommunication system; and

20 control means for generating a packet data message that may be transmitted between the management unit and the controller via the wireless communication link.

24. A system as claimed in claim 23, wherein the control 25 means are comprised in the management unit.

25. A system as claimed in claim 24, wherein the packet data message contains control instructions for the controller.

30 26. A system as claimed in claim 23, wherein the control means are comprised in the controller.

27. A system as claimed in any of claims 23 to 26, wherein the controller is provided with means for presenting to the viewer an audio message and/or a visual message based on the packet data message generated by the management unit.

5

28. A system as claimed in any of the claims 23 to 27, wherein the television program is an educational program.

29. A system as claimed in claim 24 or any claim that is  
10 appended thereto, wherein at least one element of the controller is arranged to be operated based on the packet switched message generated by the management unit.

30. A system as claimed in any of the claims 23 to 29,  
15 wherein the packet data switched telecommunications system comprises at least one of the following networks: a General Packet Radio Service network; Enhanced Data Rate for GSM Evolution Network; a Universal Mobile Telecommunication System network.

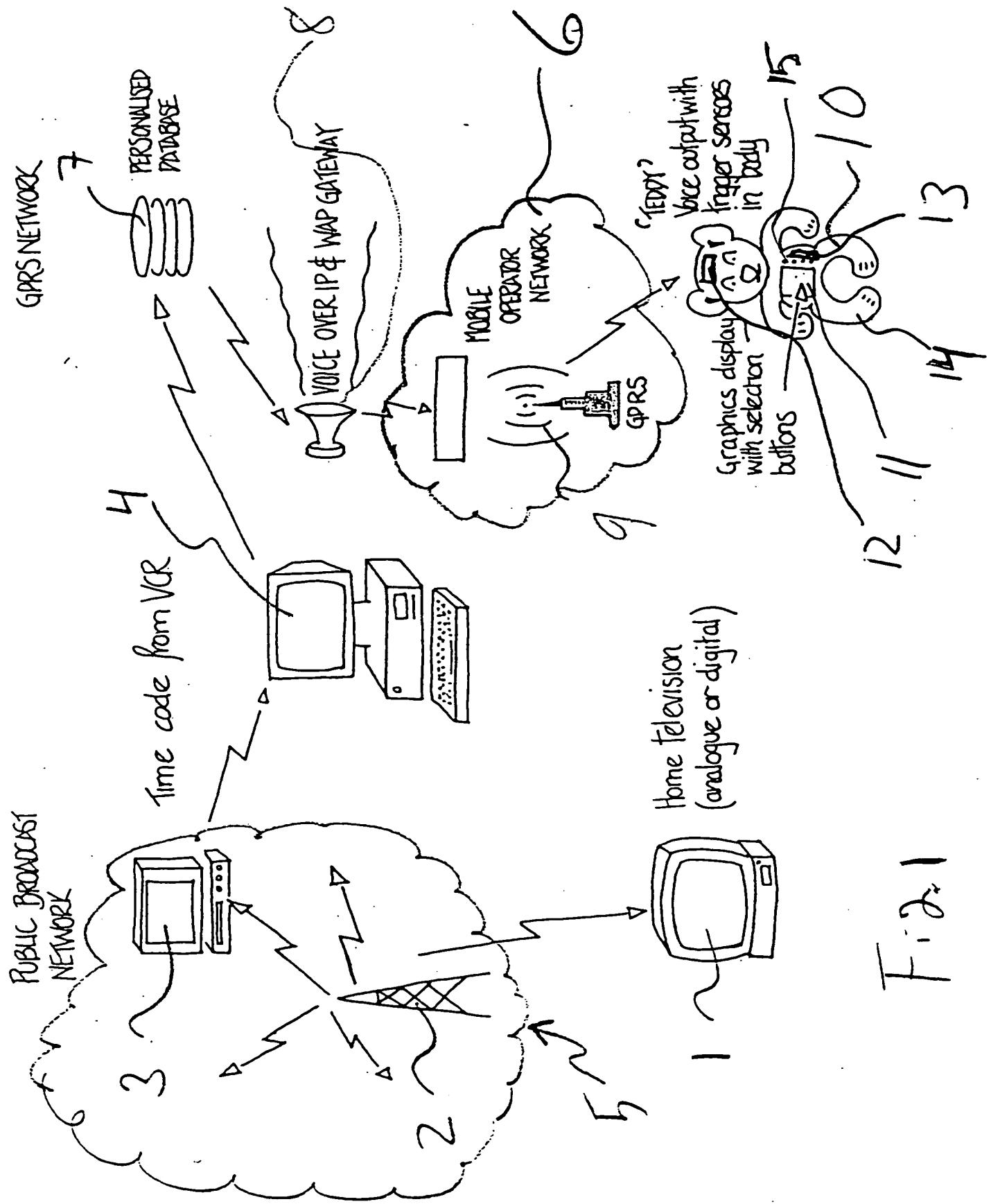
20

31. A system as claimed in any of the claims 23 to 30, comprising a database for storing information regarding the viewer.

25 32. A system as claimed in any of the claims 23 to 31, wherein the controller associates with a toy.

33. A system as claimed in claim 32, wherein the toy is a cuddly toy, a dolly or the like.

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F.2.1



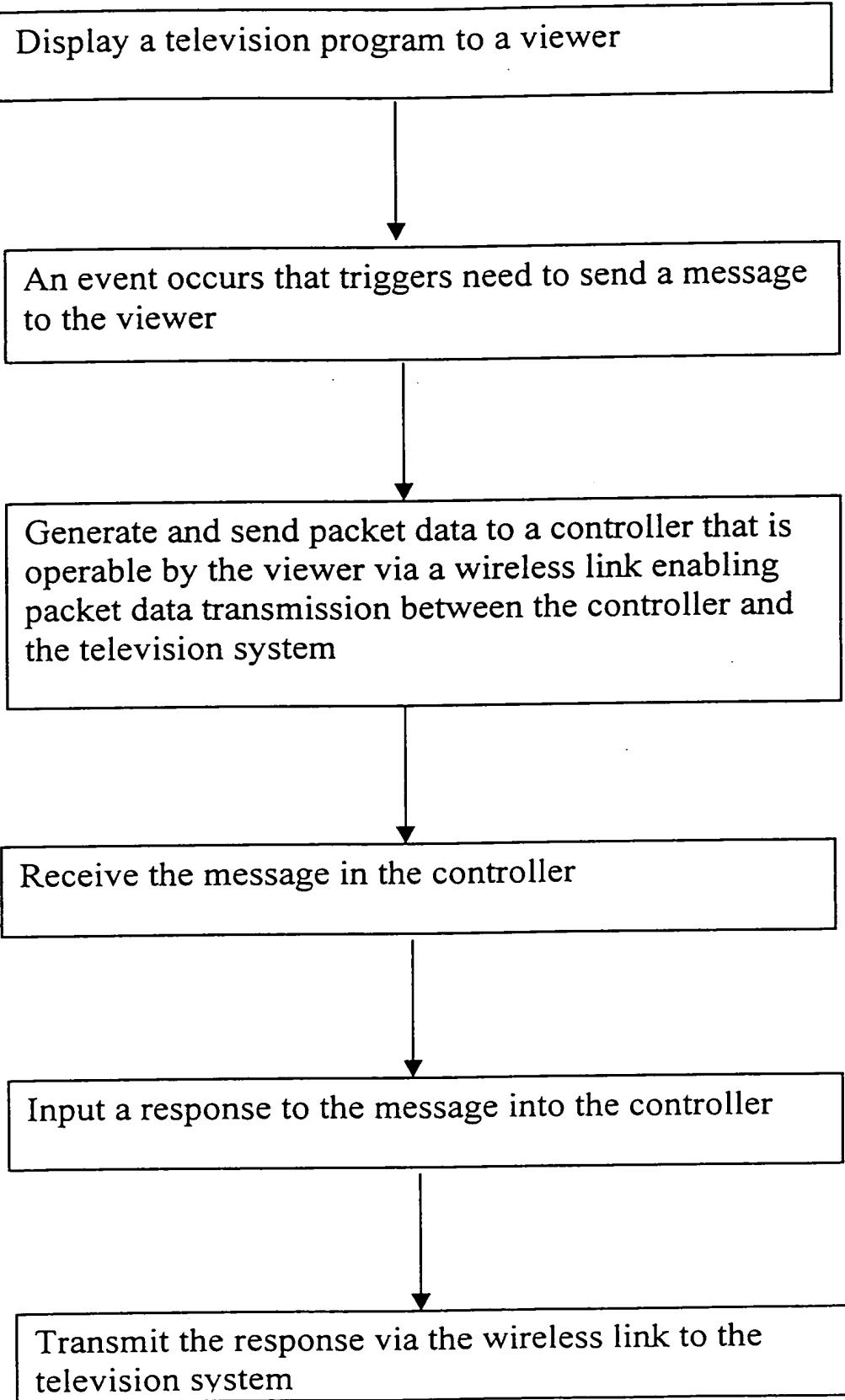


Fig. 2

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Docket No. P108800-00001  
Serial No.: New Appln. Filed: October 24, 2000